

Remark

Applicants respectfully request reconsideration of this application as amended.

No Claims have been amended, cancelled or added. Therefore, claims 1, 3-13 and 18-25 are present for examination.

Double Patenting

Claims 1, 3, 5-10, 12, 13, and 22-25 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8, 10, 11, 13 and 18-22 of U.S. Patent No. 7,016,429. The claims of USPN 7,016,429 lack at least the entire second element of the present claims as follows:

"creating a set of extended sequences, each based on an original ordered sequence of the set of ordered sequences by beginning with an element of the original ordered sequence of the set of ordered sequences, cyclically appending elements of the original ordered sequence of the set of ordered sequences in order to obtain a desired extended sequence length comprising at least one subsequence"...

"such that a training sequence can be generated from any one of the modified extended sequences by beginning with a first element of a subsequence of the any one modified extended sequence and taking each element of the subsequence in order to obtain the training sequence"...

Absent these important elements, Applicants submit that the claims of the present application are not obvious in light of the claims of the prior patent.

35 U.S.C. §103 Rejection

Balakrishnan in view of Tarokh

The Examiner has rejected claims 1, 3-7, 11, 12 and 18-25 under 35 U.S.C. §103 (a) as being unpatentable over Balakrishnan et al., U.S. Patent Application Publication no. 2003/0058926 ("Bala") in view of Tarokh, "On the computation and reduction of the peak-to-average power ratio in multi-carrier communications" ("Tarokh").

With respect to Bala, the Examiner has cited to paragraph 54, which describes selecting training sequences. Comparing this to e.g. Claim 1 shows that it is missing at least the boldface items.

"creating a set of extended sequences, each based on an original ordered sequence of the set of ordered sequences by beginning with an element of the original ordered sequence of the set of ordered sequences, cyclically appending elements of the original ordered sequence of the set of ordered sequences in order to obtain a desired extended sequence length comprising at least one subsequence;"

"such that a training sequence can be generated from any one of the modified extended sequences by beginning with a first element of a subsequence of the any one modified extended sequence and taking each element of the subsequence in order to obtain the training sequence"

As is clear from the cited paragraph of the reference, first, the "cyclic prefix" does not have any definite relationship to the "cyclic sequence." Second, the "new sequences" are the training sequences. In the claim there is another operation in order to obtain a training sequence.

As to the paper by Tarokh, Applicants are unable to find this paper. It has not been made of record by the Examiner and no copy has been provided to Applicants. Applicants have found a patent No. 6,445,747, with a similar title for which one of the inventors is Tarokh. This patent has an earlier filing date than the present application and is cited in a Form PTO-1449, enclosed herewith.

In the patent, a phase shift encoder applies a phase shift to a BPSK symbol sequence prior to modulation (See e.g. Col. 7, lines 15-54). This patent is not about modifying training sequences but about modifying the entire symbol sequence. It would not be obvious to apply such an approach to only the training sequences as the subsequent data or traffic symbols would not share the PAPR properties. This would destroy most of the benefit of the process.

In addition, the Examiner has suggested that the "at least one desired property" of Claim 1 is the low normalized auto-correlation. Claim 1 recites,

"the modifying sequence being selected so that the obtained training sequence when modulated by a selected modulation format has the at least one desired property of the corresponding original ordered sequence"

However, the patent is not concerned with auto-correlation. On the contrary, the phase shift is applied just for PAPR purposes (See Summary of the Invention).

On these grounds, Applicants respectfully submit that all of the claims are allowable over the references.

35 U.S.C. §103 Rejection

Balakrishnan, Tarokh, Kelton and Wang

The Examiner has rejected claims 8 and 10 under 35 U.S.C. §103 (a) as being unpatentable over Bala and Tarokh, and in further view of Kelton, U.S. Patent No. 6,031,865 ("Kelton"). The Examiner has rejected claim 13 under 35 U.S.C. §103 (a) as being unpatentable over Bala and Tarokh in further view of Wang et al., U.S. Patent No. 6,289,062 ("Wang"). These rejections both rely on the Bala, Tarokh rejection discussed above and are accordingly traversed on the same grounds.

Conclusion

Applicants respectfully submit that the rejections have been overcome by the amendment and remark, and that the claims as amended are now in condition for allowance. Accordingly, Applicants respectfully request the rejections be withdrawn and the claims as amended be allowed.

Invitation for a Telephone Interview

The Examiner is requested to call the undersigned at (303) 740-1980 if there remains any issue with allowance of the case.

Request for an Extension of Time

Applicants respectfully petition for an extension of time to respond to the outstanding Office Action pursuant to 37 C.F.R. § 1.136(a) should one be necessary. Please charge our Deposit Account No. 02-2666 to cover the necessary fee under 37 C.F.R. § 1.17(a) for such an extension.

Please charge any shortage to our Deposit Account No. 02-2666.

Respectfully submitted,
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

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Gordon R. Lindeen III
Reg. No. 33,192

12400 Wilshire Boulevard
7th Floor
Los Angeles, California 90025-1030
(303) 740-1980